# Homework 2

"Asynchronous JavaScript and XML/JSON"

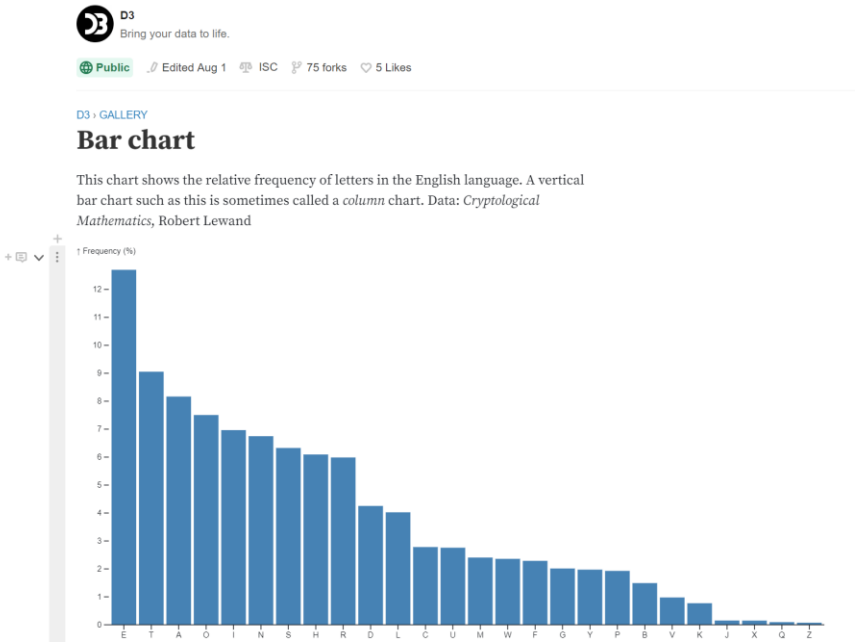
The following problem set is worth 100 points total. Please submit a zip file containing all relevant code to the Canvas drop box by the due date of the assignment.

## Requirements

The purpose of this assignment is to familiarize you with retrieving data for JavaScript applications from external data sources. You will also be incorporating a JavaScript chart engine called **D3.js** into your applications.

### D3.js

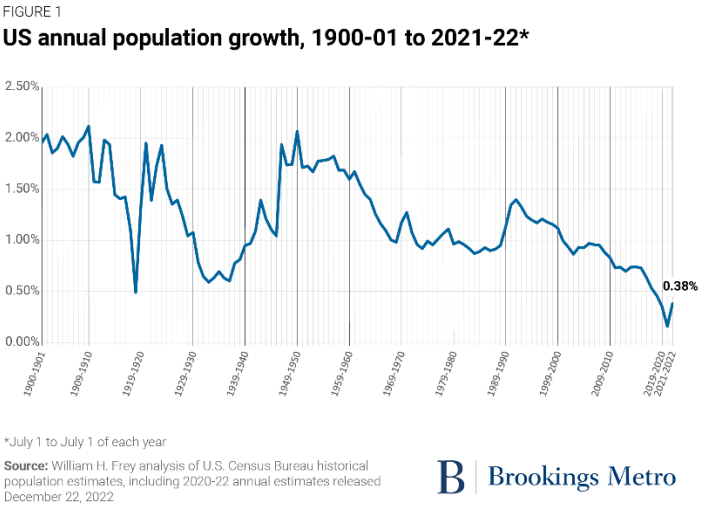
D3 is a graphics library for producing dynamic visualizations using JavaScript. It's used heavily in data science. Many organizations use it in their applications, one being the New York Times. You can see some interesting examples here (many links unfortunately are paywalled.)
https://www.nytimes.com/spotlight/graphics




For a quick start on how to use D3.js, here is an excellent tutorial: https://d3js.org/getting-started. So, with all of this out of the way, we will be building a few graphs for this assignment. And at the core, we need data.

### Population Chart (20pts)

Using D3.js, produce an application which generates a **line chart** which shows the population of the United States year over year. As an example of something you can generate:




For a barebones data set, you can use this link: https://datausa.io/api/data?drilldowns=Nation&measures=Population. If you want to be more creative however, you can query the **United States Census** with their API. Available APIs (and sample calls) can be found here: https://www.census.gov/data/developers/data-sets.html

## Word Cloud (20pt)

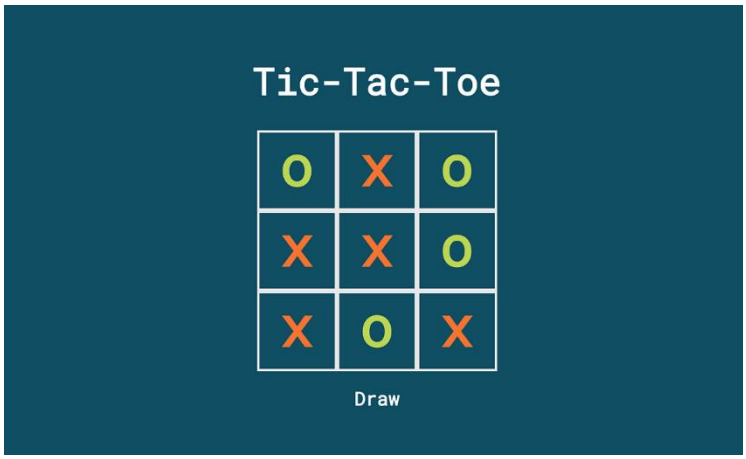
A word cloud is a visualization of text data. As an example:


**D3.js** can generate these. For this part, you will create an application which asks the user for a word. You will then query an API for all the **synonyms** of the word and then generate a word cloud. As to the API you can use, the following exists: https://www.wordsapi.com/.

***NOTE**: this is a free API for up to 2500 requests per day. You will need an API key. You can include the API key you created in your Canvas submissions. Be careful about this when developing your application.*

## Tic Tac Toe (30pt)

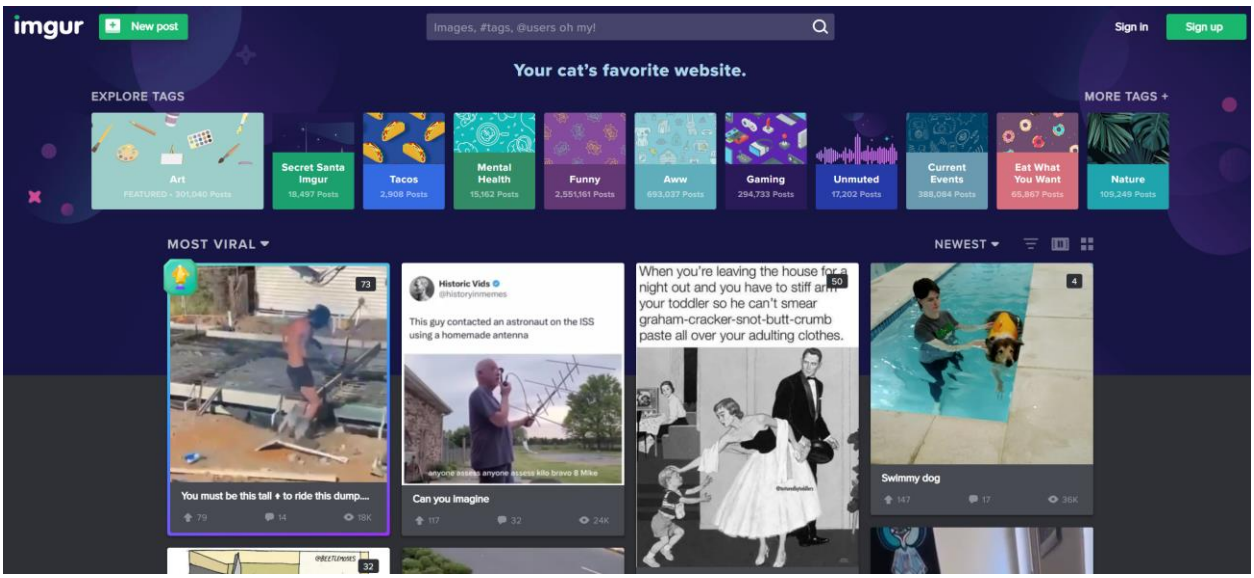
For the third assignment you will create an interactive Tic Tac Toe game between the user and the computer in JavaScript. As an example of the UI:




The only caveat with this game is when the computer opponent is making a move, it will query an API for suggestions on moves to make. There is an API you can use to assist the computer in making its move: https://rapidapi.com/stujo/api/tic-tac-toe. You will also need to sign up and obtain an API key, but there's no limit for usage requirements.

## Imgur Client (30pt)

The popular image sharing web application **Imgur** has a free application you can use to access anything: https://apidocs.imgur.com/?version=latest.




Using their API, produce a client which does the following:

- Grabs images from a random gallery
- Lists statistics about each image such as the number of likes and number of comments.
- When someone clicks on the image, retrieve each of the comments and display on a detail page.

## Submission Requirements

For the submission, submit a zip file with all assets needed for me to run your four applications. Feel free to use any technique used in class (either DOM manipulation or jQuery.) Submit using the Canvas drop box before the due date.